FOREST INSECT and DISEASE CONDITIONS in IDAHO 1977

Forest Insect & Disease Control
Bureau of Private Forestry
Division of Forest Resources
DEPARTMENT OF LANDS
Coeur d'Alene, Idaho

FOREST INSECT AND DISEASE CONDITIONS IN IDAHO, 1977

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INTRODUCTION

Through provisions of the United States Forest Pest Control Act of 1947, and as declared in the Idaho Code (Section 38 - 601-603), it is the policy of the state of Idaho to protect and preserve forest resources, watersheds and recreational values of Idaho forests from the ravages of destructive forest insect and disease pests. In meeting this responsibility, the Idaho Department of Lands conducts annual aerial and ground surveys in cooperation with the U.S. Forest Service to detect forest insect and disease outbreaks or problems. The results of these surveys for 1977 are summarized for distribution in this report.

Due to the difficulty of making accurate estimates of the number of trees killed while flying aerial surveys (90-120 mph, 500-2000 ft), these values should not be taken to be an exact measurement of the damage that has occurred. Comparison of aerial survey data with ground check plots has shown that the estimates of numbers of trees killed are consistently low. However, the location and trends of insect damage from one year to the next can be accurately shown by the maps and by comparing this year's counts with last year's.

The narrative portion covers only those pest conditions on or near State and/or private forested lands. The maps at the end of the report, however, show the major problem areas for all ownerships. The green portion is national forest land, the white is state, private and other federal with major blocks of state ownership outlined with a heavy dark line. We have included this additional information as we feel there is a need to show conditions for the entire state so that those interested can find it in one source.

Included in this report are discussions of forest insect projects being conducted in cooperation with the U.S. Forest Service. Through cooperation with the U.S. Forest Service, Region I, Missoula, Montana, we are presenting summaries of the infested acres and/or trees, with an estimate of volume affected, for each of the major forest pests being reported. This has been compiled for two years for the state and privately owned land in each of the State Forest Protective Districts of northern Idaho. While there are voids in data base, we anticipate that this methodology will allow us to make better comparisons of trends and losses throughout the state.

SUMMARY OF CONDITIONS

ENTOMOLOGY

Bark beetles have continued to be a major cause of mortality in the conifer forests of Idaho in 1977. The Douglas-fir bark beetle, while still causing considerable mortality, has decreased in overall damage for the entire state. This is especially true for northern and eastern Idaho. The western pine beetle is at very low levels. Nearly all of the attacks by this beetle were found in trees where the upper crown had been attacked by *Ips*. The pine engraver beetle, apparently due to drought, increased its activity many times, killing many thousands of trees in 1977. The mountain pine beetle is generally at a low level in northern Idaho, but maintained its heavy damage in the McCall area and in eastern Idaho. The fir engraver beetle populations were also at low levels.

The western spruce budworm is at high levels in northern and southwestern Idaho. In eastern Idaho the infested area has declined. Total acres infested for the state (all ownerships) are approximately 1.5 million acres. No operational control projects were conducted in Idaho in 1977. Douglas-fir tussock moth populations were found by pheromone trapping of males, but the levels are very low. The larch casebearer also appears to be at low levels throughout the state. This year it was found for the first time south of the Salmon River. Other insects that may be of greater concern next year include the pine butterfly, the black pineleaf scale, and the pine shoot borer, *Eucosma*.

PATHOLOGY

The magnitude of larch problems observed this year were in stark contrast to the other disease problems which remained relatively static. Extensive areas of larch in northern Idaho turned red-brown late in the summer due to a combination of needle diseases and insects.

White pine blister rust is continuing to cause severe losses but the U.S. Forest Service has recently issued guidelines to aid in selection of more resistant leave-trees. A rust causing yellow witches broom on true firs remains at high levels of infection in many eastern Idaho areas.

Root rots continue to be a baffling problem causing widely varying amounts of losses. There is a growing need for more information and research as more foresters become aware of their root rot problems.

Dwarf mistletoes are the number one disease problem in southern Idaho where entire stands of ponderosa pine, Douglas-fir and lodgepole pine may have high levels of infection. In northern Idaho, dwarf mistletoe on larch is the major concern, with pockets of Douglas-fir and ponderosa pine dwarf mistletoes of localized importance.

A brief report giving the status of Dutch elm disease in Idaho has been included. While not a forest problem, dollar losses in many southern Idaho communities may be considerable.

INSECT CONDITIONS

BARK BEETLES

DOUGLAS-FIR BEETLE, *Dendroctonus pseudotsugae,* Hopkins

The Douglas-fir beetle continues to be the most serious threat to Douglas-fir in Idaho. Overall, however, the populations with resultant damage have decreased. Of 12 areas mentioned in the narrative below (the letters correspond to those on the map) one is at the same mortality level as last year, seven are lower, two are higher, and two small new ones were found.

A & B (= Area #1 of 1976 Report)

These two areas, northeast of St. Maries, Benewah County, are continuations of an infestation that first appeared in 1976. This year the activity is more concentrated with the beetle infested tree groups centered around St. Joe Baldy and Reeds Baldy (A), and on the north side of Fitzgerald Peak (B). Overall, the beetles have killed approximately the same number of trees in 1977 (216) as in 1976 (210).

1977 (A)-9 dead tree groups averaging 14 trees/group.
(B)-5 dead tree groups averaging 18 trees/group.

1976-14 widely scattered dead tree groups averaging 15 trees per group.

1975-No activity.

Another area of activity, but not shown on the map, encompasses the headwaters of Rubis, Flat and Little Bear Creeks on the north, west and south sides of Boundary Point and in the headwaters of Sand Creek to the west and southwest of Mica Mountain, Latah County. This corresponds to Area 2 of the 1976 report. In general, activity seems to be lower in 1977.

1977 - 15 dead tree groups averaging 10 trees per group.

1976 - 33 dead tree groups averaging 8 trees per group.

1975 - 5 groups.

C (= Area #3 of 1976 Report)

An area of approximately 19 square miles 4-8 miles northeast of Laird Park, Latah County. Many groups are located in the headwaters of Strychnine and Poorman Creeks, the North Fork of the Palouse River, Wagner Gulch, Stevens and Mizpah Creeks. Activity has increased since 1976, with more and slightly larger groups covering a larger area.

1977 - 43 dead tree groups averaging 15 trees per group.

1976 - 36 dead tree groups averaging 13 trees per group.

1975 - 7 groups.

D (New Area)

An area of approximately 3 square miles on the south slopes of Emerald and West Emerald Buttes, Latah County.

1977 - 8 dead tree groups averaging 18 trees per group.

1976 - No activity.

E (= Area #6 of 1976 Report)

The activity in this area has increased in 1977. The attacked trees are concentrated on the south side of the Little North Fork of the Clearwater River extending from just outside the national forest boundary 5 miles upstream to Bear Creek. There are a few groups on the north side of the drainage. Most of the dead tree groups are in national forest lands.

1977 - 12 dead tree groups averaging 11 trees per group.

1976 - 8 dead tree groups averaging 7 trees per group.

1975 - 7 groups.

F (= Area #4 of 1976 Report)

An area of approximately 7 square miles northwest of Elk River, Clearwater County, extending across the headwaters of Shattuck and Squaw Creeks to the west side of Jackson Mountain. Beetle activity has decreased in the area, going from approximately 750 attacked trees in 1976 to 390 in 1977. Salvage and silvicultural management activities are currently under way on state lands.

1977 - 24 dead tree groups averaging 16 trees per group.

1976 - 58 dead tree groups averaging 14 trees per group.

1975 - 10 groups for the entire area.

G (= Area #5 of 1976 Report)

An area of approximately 7½ square miles southwest of Elk River, Clearwater County, in the Meadow Creek drainage. Activity in this area has also decreased both in the number of trees killed (1977 - 113 trees; 1976 - 230 trees) and the area of infestation (1977 - 7 sq mi; 1976 - 12 sq mi). However, the average number of trees per group increased slightly in 1977.

1977 - 12 dead tree groups averaging 9 trees per group.

1976 - 33 dead tree groups averaging 7 trees per group.

1975 - 18 groups.

H (= Area #8 in 1976 Report)

Activity in this area has dropped dramatically in 1977. The major activity is located on the southern slopes of Democrat and Bald Mountain. A smaller group of dead trees lies to the west of Whiskey Butte.

1977 - 11 dead tree groups averaging 13 trees per group.

1976 - 49 dead tree groups averaging 11 trees per group.

1975 - 15 groups.

I (New Area)

The beetle attacks are scattered over approximately 2 square miles at the junction of the Little White Bird and South Fork of White Bird drainages, Idaho County. This is entirely within national forest boundaries.

1977 - 6 dead tree groups averaging 7 trees per group.

1976 - No activity.

J & K

These two areas of state land in southeastern Idaho have had Douglas-fir bark beetle killed trees for many years. Much of the stand is old growth and appears to be very susceptible to attack.

(J) 1977 - 14 dead tree groups averaging 14 trees per group.

1976 - Area not surveyed.

1975 - 41 dead tree groups averaging 21 trees per group.

(K) 1977 - 12 dead tree groups averaging 12 trees per group.

1976 - Area not surveyed.

1975 - 82 dead tree groups averaging 17 trees per group.

While the level of beetle activity has decreased many times since 1975, the drought of 1977 may decrease the resistance of the trees and stimulate an increase in the number of attacks.

In southwestern Idaho the large outbreak on federal lands is continuing to cause the death of thousands of Douglas-fir trees with the Boise National Forest suffering the largest mortality. State and private intermingled lands constitute a very small portion of the infested area. Over the entire outbreak the infestation has declined from 1976 levels.

Douglas-fir bark beetle, stand hazard rating. In cooperation with the U.S. Forest Service, R-4 Insect and Disease Management and the Intermountain Station, Moscow, we have been working on a project to identify the characteristics of Douglas-fir stands that are susceptible to attack by the Douglas-fir

bark beetle. This is being done by surveying mortality centers identified from aerial survey maps. With this information we hope to be able to develop a stand risk-rating system. By using this system a land manager will be able to identify high risk areas and then prioritize management activities to reduce losses caused by this pest.

WESTERN PINE BEETLE, *Dendroctonus brevicomis*, LeConte

Activity of this beetle is at a very low level in northern Idaho. No dead tree groups due to this insect were recorded during the aerial survey. However, during ground checking of *Ips* killed ponderosa pine, we found 1-3 trees with western pine beetles in the lower 30 feet of the bole in nearly all dead tree groups. It appeared that as the engraver beetles attacked and killed a group of trees they often did not occupy the lower bole and this was the area being utilized by *D. brevicomis*.

In southern Idaho there wasn't any western pine beetle activity recorded on state or private lands and only two small areas were found on federal land, both of these being in Adams County.

The drought of 1977 has undoubtedly influenced this insect, allowing it to make successful attacks and build up the population. If present, these attacks may not show up until spring or early summer of 1978.

PINE ENGRAVER BEETLES, *Ips*, spp.

The drought of 1977 has had a very pronounced effect on the success of pine engraver beetles in Idaho. In 1976 the populations were at very low levels with slash being uninfested in some areas and only 480 dead trees attributed to their attack on all state and private lands.

In 1977 an estimated total of 9,000 dead ponderosa pine trees were counted in the 22 areas of concentrated activity marked on the maps which are on or near state or private lands. These areas are described below with the numbers corresponding to those on the map. There are also many other dead tree groups scattered throughout the host type between the mapped areas. The attacked trees range in diameter from nearly 36" down to 4-5". The average size tree killed is about 12" dbh.

Most of these dead tree groups faded and became noticeable in late summer or early fall. Since trees that are attacked and killed usually don't change color until the next spring, we feel that the dry season caused these to fade earlier than normal. There still may be more attacks that will follow the normal pattern and show up in the spring of 1978.

In many areas the engraver beetles have attacked the tops of the trees but have left the bottom trunk untouched. As late as February 1978 these lower portions of the bole looked fresh and healthy when chopped into. This was so, even where the entire crown was dead and faded. We are initiating a survey to see what insects, if any, utilize these uninfested trunks in 1978.

Ponderosa pine trees
killed by *Ips* beetles.

Pine engraver beetle galleries.

TABLE I

Pine Engraver Beetle Attacks

Area Number	Number of Dead Tree Groups/Area	Total Number Dead Trees	Average Dead Trees/Group	Area Location
1	55	117	2	Southeast of Spirit Lake, Kootenai County
2	12	339	33	North side of Mica Bay, Kootenai County
3	8	200	25	West of Worley, Kootenai County
4	10	124	12	West of Plummer, Benewah County
5	14	460	33	South of Plummer, Benewah County
6	17	255	15	East of Tensed, Benewah County
7	3	125	42	East of Orofino, Clearwater County
8	10	245	25	Southeast of Orofino, Clearwater County
9	8	141	18	Southeast of Greer, Clearwater County
10	6	185	31	West of Keuterville, Idaho and Lewis Counties
11	10	114	11	East of Boles, Idaho County
12	11	72	7	Headwaters of Divide Creek, Idaho County
13	23	316	14	Northwest of Whitebird, Idaho County
14	10	465	47	Little Salmon River Canyon, Idaho-Adams Cos.
15	31	810	26	NW, W and S of New Meadows, Adams County
16	45	1085	24	Between Tamarack and Council, Adams County
17	6	190	32	6 miles west of Evergreen, Adams County
18	18	940	52	Northwest of Council, Adams County
19	70	1325	19	East of Cascade Reservoir, Valley County
20	37	550	15	South of Sage Hen Reservoir, Gem County
21	10	235	24	South of Smith's Ferry, Valley County
22	19	805	42	West of Banks, Boise County
	433	9098		

MOUNTAIN PINE BEETLE, *Dendroctonus ponderosae*, Hopkins

In northern Idaho tree mortality attributed to the mountain beetle continues at very low level. There was only one area of significant activity, this being in the Craig Mountain area of Nez Perce County where approximately 2,600 dead lodgepole pine were found just south of Soldiers Meadow Reservoir. Ground checking verified the cause to be the mountain pine beetle. At the same time we found many new attacks in green trees. The drought of 1977 apparently has weakened the trees and may have provided the stimulus for a much larger outbreak in the area.

In southern Idaho, between McCall and Smith Ferry, mortality of both lodgepole and ponderosa pine continued at high levels. Of special concern was the mortality on the land of small property owners and summer home lake lots of the area. Many requests were received for technical assistance from these land owners. For the first time, Sevimol-4 (carbaryl insecticide) was registered and used within the state as a protective spray on pines against the mountain pine beetle. This technique has been tested and found very effective in protecting pine trees.

In eastern Idaho the very extensive outbreak in the lodgepole pine forests is still increasing and causing severe mortality. The most damaging infestation continues to be centered on the Targhee National Forest and adjacent state and private lands.

A 1977 U.S. Forest Service survey of the Targhee area provided the following information:[1/]

Intensity of Attacked Trees	Acres Surveyed	1977 Faded Trees		Standing Dead Trees	
		Number	Volume (Cu. Ft.)	Number	Volume (Cu. Ft.)
Light (<2 faded trees per acre)	272,243	1,497,609	28,245 M	12,722,000	180,382 M
Medium (2-3.5 faded trees per acre)	72,883	1,079,762	17,481 M	3,077,000	43,332 M
Heavy (>3.5 faded trees per acre)	51,680	1,032,256	19,035 M	1,952,000	25,801 M
TOTAL	396,806	3,609,627	64,761 M	17,751,000	249,515 M

As measured by this survey, on 396,806 acres there are a total of 21,360,627 dead trees with a volume of 314,276,000 cubic feet.

1/ Mountain Pine Beetle Survey, 1977.
Targhee National Forest
Preliminary Results
Robert W. Young USFS, Methods Application Group
Davis, California

FIR ENGRAVER BEETLE, *Scolytus ventralis*, LeConte

Mortality due to the fir engraver beetle is currently at a very low level in northern Idaho. Generally activity is lower in all areas than it was in 1976. This is a continuation of the downward trend that has been occurring since 1975 when the population appeared to reach a peak. The 1975 outbreak got its start with the drought of 1973. The dry year of 1977 may again serve as the impetus for an outbreak. In the following table, the area numbers correspond with the numbers on the map.

TABLE II

Fir Engraver Attacks

Area Number	Number of Dead Tree Groups/Area	Total Number Dead Trees	Average Dead Trees/Group	Area Location
1	30	157	5	South of Priest River, Bonner County
2	9	41	5	Northeast of Blanchard, Bonner County
3	25	207	8	East of Rathdrum, Kootenai County
4	10	121	12	West of Coeur d'Alene, Kootenai County
5	23	312	14	South of Chatcolet, Benewah County
6	13	169	13	South of St. Maries, Benewah County
7	7	90	13	North of Princeton, Latah County
8	6	345	58	Northeast of Weippe, Clearwater County
9	9	95	10	South of Weippe, Clearwater County
10	5	25	5	North of Woodrat Mountain, Idaho County
11	3	60	20	South of Grangeville, Idaho County
	140	1,622		
1976 totals	690	13,480		

DEFOLIATORS

WESTERN SPRUCE BUDWORM, *Choristoneura occidentalis*, Freeman

Overall, the western spruce budworm is currently causing more damage to the conifer forests of Idaho than any other insect pest. This is in the form of growth loss, top kill and mortality of the host trees. The total acres infested in Idaho in 1977 were 1,582,121. The ownership breakdown is roughly as follows:

		Acres	
		1977	1976
North Idaho			
Private		34,335	87,160
State		2,300	4,480
Federal		610,541	564,071
	Subtotal	647,176	655,711
Southwestern & Central Idaho			
Private		82,648	Not available
State		14,585	" "
Federal		824,132*	" "
	Subtotal	921,365	845,900**
Eastern Idaho			
Private			160
State		310	700
Federal		13,270	28,340
	Subtotal	13,580	29,200
	GRAND TOTAL	1,582,121	1,530,811

* Includes 291,037 acres of Idaho Primitive Area.
** Includes 387,600 acres of Idaho Primitive Area.

In northern Idaho the infestation overall has remained at approximately the same level. However, the aerially visible defoliation boundaries have changed in some areas. This is the case in the headwaters of the Lochsa River where the visible damage has shifted approximately 15 miles to the west. Similar westward patterns of movement were observed in other parts of the infestation in 1976.

South of the Salmon River on the Boise and Payette National Forests and adjacent state and private lands near McCall, Idaho the infestation has continued at high population levels. On the Boise National Forest defoliation increased by nearly 42,000 acres from 1976. On the Payette National Forest and adjacent state and private lands defoliation decreased by approximately 68,000 acres. However, the degree of defoliation was higher with nearly twice as much heavy defoliation in 1977 as in 1976.

An impact survey of 44 stands from within the commercial forest of the McCall area outbreak showed that, overall, 23% of the trees sampled had been top killed by the budworm. Top killing was heaviest in trees 5 inches dbh or smaller. Mortality equalled 0.5% in trees larger than 5 inches and 3.7% in trees smaller. Grand fir in areas of the most intense defoliation were found

to be growing at 87% of normal with the reductions amounting to 36 bfm per acre per year. For all host species combined, the trees were growing at 92% of normal with an average growth loss of 46 bfm per acre per year.

In 1977 two chemical tests were conducted against the western spruce budworm in the McCall, Idaho area. The largest was a pilot control project testing Orthene at a reduced dosage of 1/2 lb active ingredient (AI) per acre on three 1,000-acre blocks. It was conducted by the U.S. Forest Service, with cooperation from the Idaho Department of Lands and Boise Cascade Corporation, to compare the results with similar tests using Orthen applied at 1 lb AI/acre. The test reduced the population by 91% (unadjusted for natural mortality) which compares very favorably with the 93.8% population reduction obtained using 1 lb AI Orthene/acre.

The second test was conducted by the U.S. Forest Service Pacific Southwest Forest and Range Experiment Station using Reldan at several dosages on 68 100-acre plots. Those conducting the tests have concluded that they did not get adequate population reduction to warrant continuing development of this pesticide as a tool for use against the western spruce budworm.

DOUGLAS-FIR TUSSOCK MOTH, *Orgyia pseudotsugata*, McDunnough

Douglas-fir tussock moth activity continued at very low levels throughout Idaho in 1977. In northern Idaho no larvae were found in ten 400-tree survey plots sampled by beating lower crown branches and collecting the falling insects on a hand-held drop cloth. These survey areas ranged from the Coeur d'Alene Mountains to the Clearwater Mountains southeast of Kooskia with the sampling being done in many of the same areas surveyed in 1976 when no larvae were found. However, pheromone traps placed in the same ten survey areas did attract and catch male Douglas-fir tussock moths as they did in 1976 showing that a low level population is present.

The pheromone trapping has been developed to where it can be implemented on an operational basis to try and detect the increasing population levels that are indicative of a potential outbreak. In 1978 pheromone traps will be deployed over a widespread area of host type in northern Idaho that has sustained several outbreak populations of the Douglas-fir tussock moth in the past. Comparisons of the annual moth catch will be made.

In southern Idaho Douglas-fir tussock moth populations are very low also. Larvae were found by the lower crown beating method in Owyhee and Camas counties but at very low population levels. Adult male moths were caught in pheromone traps in these same areas.

The only defoliation in Idaho known to be caused by the Douglas-fir tussock moth was on an ornamental spruce tree found approximately three miles south of Boise.

LARCH CASEBEARER, *Coleophora laricella*, (Hubbner)

The larch casebearer was found for the first time south of the Salmon River in 1977. Further investigations in the areas by the U.S. Forest Service found it to be widespread, but at low population levels.

In northern Idaho, casebearer populations were difficult to identify during aerial surveys due to the complex of insect and needle disease problems found on larch. Therefore, we have labeled the areas of larch foliage discoloration on our map as "Larch Problems." A complete description of this complex is included on page 16.

OTHER INSECTS

SAWFLIES

The pine sawfly (*Neodiprion* spp.) discovered in 1975 has continued to cause defoliation of some lodgepole pine in 1977. No tree mortality has been observed. Reports and observations have been fewer in 1977 and it is anticipated that the population will decline of natural causes.

As mentioned previously, it appears that a larch sawfly, possibly *Pristiphora erichsonii* (Hartig), has increased in numbers and may be causing extensive, light defoliation in northern Idaho. Populations of this insect were reported on approximately 2,000 acres in the Nelson District of British Columbia in 1977.

GYPSY MOTH, *Lymantria dispar*, (Linnaeus)

Once again the Department of Lands, in cooperation with the U.S.D.A. APHIS, Plant Protection Division, conducted a pheromone detection survey for the gypsy moth. Traps were placed at 232 sites surveying the major campgrounds, rest stops, trailer parks and tourist attraction sites throughout the state. No gypsy moths were found in Idaho in 1977.

PINE BUTTERFLY, *Neophasia menapia* (Felder & Felder)

Many adult pine butterflies were seen flying in ponderosa pine stands of northern Idaho in 1977. Since very few were seen in 1976 this increase may be an indicator of population buildup which may develop into epidemic proportions. The last outbreak of the pine butterfly occurred in the Bitterroot Valley of Montana in 1969-71.

PINE SHOOT BORER, *Eucosma* spp.

In cursory surveys of several ponderosa pine plantations in northern Idaho we have found that the *Eucosma* shoot borer is present nearly everywhere. Their presence is indicated by many dead terminals, both leaders and on lateral branches. Dissection of these terminals reveals the resin soaked frass which is typical of *Eucosma* boring. By dissecting slightly drooping terminals found in early July we have been able to find many larvae. More detailed surveys to determine the extent of the population and to measure impact are being planned for 1978.

WESTERN GALL RUST, *Endocronartium harknessii* (J. P. Moore) Y. Hiratsuka

This common rust disease can be found at various levels of intensity throughout the state on lodgepole pine and ponderosa pine. Mortality usually occurs in reproduction, but older trees which have apparently overgrown stem attacks are poorly formed and become highly susceptible to wind breakage. In most areas there appears to be enough naturally resistant seedlings so that the gall rust works as a thinning agent, weeding out those trees with low natural resistance.

YELLOW WITCHES BROOM (FIR BROOM RUST), *Melampsorella caryophyllacearum* Schroet.

Compact yellowish witches brooms caused by this rust fungus can be found in grand fir and subablpine fir throughout the state, but are the heaviest in eastern Idaho on subalpine fir. The yellow color is due to the fungus which fruits abundantly on the needles.

Although no mortality is apparent, growth rates are reduced and heavily infected trees may be predisposed to other deleterious agents. If timber production is a major concern in these areas, we recommend that Douglas-fir and lodgepole pine be encouraged since they are unaffected by this disease.

Root Rots

Root rots continue to be a vexing problem as they cause various amounts of mortality throughout the state. During the past year State and U.S. Forest Service personnel examined Douglas-fir in mortality centers in the Boise National Forest and found *Polyporus schweinitzii* Fr. root decay commonly associated with Douglas-fir bark beetles. The presence of insects and diseases interacting as a complex in causing tree mortality makes recognition and treatment difficult since all factors must be considered in sound management prescriptions.

In northern Idaho, the Forest Service has initiated a root rot study in the Panhandle National Forest to examine the effects of different harvesting methods on regeneration in clearcut root rot centers. As foresters become more familiar with the symptoms of root rot problems more centers will continue to be discovered, increasing the demand for additional research.

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SATIN MOTH, *Stilnotia salicis*, (L.)

This moth, which is an imported species, has been found throughout northern Idaho feeding mainly on cottonwood and willow. It has not been observed to cause any problem. The pure white moths are often seen in large numbers around yard and street lights in July and early August.

PINE TIP WEEVIL, *Pissodes schwarzi*, Hopkins

A weevil was found mining in the terminals of young ponderosa pine in the Jack's Creek seed orchard near McCall, Idaho. The boring caused the death of the infested terminals. The area is of special interest due to the high value of the trees.

BLACK PINELEAF SCALE, *Nuculaspis californica* (Coleman)

The black pineleaf scale has been causing defoliation and mortality of ponderosa pine trees at the Lenore Rest Stop on U.S. Highway 12, 16 miles west of Orofino. After finding it present there we conducted a survey up and down the Clearwater River valley and into all side drainages from Lewiston to Winchester, Kendrick, Fraser, Nezperce, Kooskia and Grangeville. In addition to the rest stop, scale insects were readily found in three general areas as described below:

1. Along the bottom of the Potlatch River Canyon from Juliaetta southwest to within 4 miles of the junction of Idaho 3 and U.S. 12.

2. Along the south side of the Clearwater River from the junction of Idaho 3 and U.S. 12, east to within 3 miles of Orofino.

3. On the slopes surrounding Kamiah and to Nezperce on the west.

In most areas the scale is causing defoliation of all ages of trees. The defoliation is most intense in the lower branches, and as it progresses into the upper crown mortality of the host occurs. In our survey the heaviest populations were found at the Lenore Rest Stop. This was also the only area where mortality could be attributed to the scale.

Ponderosa pine trees infested with black pineleaf scale.

Ponderosa pine needle showing the dense scale population.

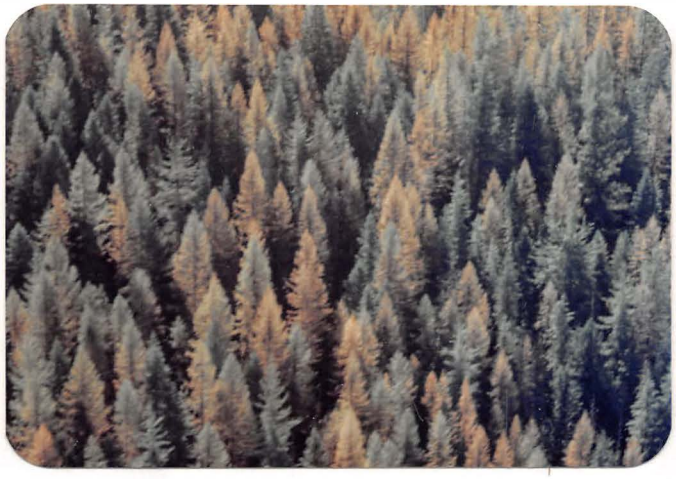
DISEASE CONDITIONS

Needle Cast

LARCH PROBLEMS

Larch this year were host to a number of maladies and especially widespread was a combination of larch needle cast fungi and a larch sawfly. By mid-summer extensive areas of larch around Clarkia, north and west of Bovill, and from Kelso Lake north to Sandpoint and the Pend Oreille River (see attached map) were turning brown-red. We observed smaller problem areas in the Palouse Range northeast of Moscow and along the Washington border, while the U.S. Forest Service and University of Idaho reported the problem from Montana and the Wallowa Mountains in Oregon. In some areas the larch casebearer was found in addition to the needle cast and sawfly but was usually of little significance. In fact, University of Idaho researchers found larch needle cast fungi to be the biggest single factor in larch casebearer mortality in these areas.

Needle cast infection is first seen as a small brown spot on the needle which gradually enlarges to kill the entire needle while the sawfly damage can be identified by the jagged appearance of the chewed needles.



Typical mixed forest showing red-brown foliage on larch.

Sawfly chewing damage and needle cast infection spots.

It is difficult to predict what the situation may be next year, but continued severe defoliation would undoubtedly reduce growth. Effects of the 1977 season were probably slight since most growth had been completed prior to infection.

PONDEROSA PINE NEEDLE CASTS

Elytroderma needle cast (*Elytroderma deformans* (Wier) Darker) is the most common and most damaging needle cast on ponderosa pine as this disease becomes perennial and can cause severe growth losses. The brooming effect caused by this fungus has often been confused with dwarf mistletoe, but can usually be identified by the presence of a large number of dead needles trapped in the brooms.

We also received several inquiries concerning a "grey-beard" needle cast where older needles turned grey and hung as a grey beard from the branches. While *Lophodermium pinastri* Chev. is often blamed for the problem, several other fungi are involved as the needles weaken and die. This disease is widespread but usually of little concern since only a portion of the older needles are affected.

LODGEPOLE PINE NEEDLE CAST, *Lophodermella concolor* (Dearn.) Darker

The lodgepole pine in the Deer Creek area near Craigmont were extensively infected by this needle cast last spring. By fall the branches had a very patchy appearance because all the infected 1-year-old needles had fallen leaving the older needles (which resist infection) and the year's new growth. Infection of this year's needles will not show up until spring.

RUSTS

WHITE PINE BLISTER RUST, *Cronartium ribicola* J. C. Fisch. ex Rab.

Because of the difficulty in recognizing white pine blister rust during aerial surveys we have combined two years of observations on the attached map to give a more realistic picture of the extent of the problem.

Significant timber losses are still occurring in the Hoodoo Mountain area from Avery west to Plummer and south to Harvard, Deary and Bovill, where several thousand acres of mixed ownership are involved. Another broad area of infection is east and north of Priest Lake with scattered pockets of infected trees south along Priest River to the Pend Oreille River in northern Idaho. Additional reports show infections south and west of Elk River, and in a broad area southwest of the North Fork of the Clearwater extending south to Gold Creek. Over 15,000 acres of state and private timber lands are affected.

Although concentrated efforts to develop disease resistant nursery stock show some promise, the U.S. Forest Service anticipates that it will be several years before enough stock is available to adequately meet all needs. In the meantime, conscientious efforts should be made to leave apparently disease-free white pine for seed trees in sale areas with high amounts of rust. This alone can greatly enhance the natural selection process by producing as much as 20% more resistant seedlings. A pamphlet ("Selecting Western White Pine Leave-Trees") to aid foresters in selecting the best leave trees has recently been compiled and is available from Drs. Ray Hoff and Geral McDonald of the U.S.F.S. Forest Sciences Laboratory at Moscow, Idaho

WESTERN GALL RUST, *Endocronartium harknessii* (J. P. Moore) Y. Hiratsuka

This common rust disease can be found at various levels of intensity throughout the state on lodgepole pine and ponderosa pine. Mortality usually occurs in reproduction, but older trees which have apparently overgrown stem attacks are poorly formed and become highly susceptible to wind breakage. In most areas there appears to be enough naturally resistant seedlings so that the gall rust works as a thinning agent, weeding out those trees with low natural resistance.

YELLOW WITCHES BROOM (FIR BROOM RUST), *Melampsorella caryophyllacearum* Schroet.

Compact yellowish witches brooms caused by this rust fungus can be found in grand fir and subablpine fir throughout the state, but are the heaviest in eastern Idaho on subalpine fir. The yellow color is due to the fungus which fruits abundantly on the needles.

Although no mortality is apparent, growth rates are reduced and heavily infected trees may be predisposed to other deleterious agents. If timber production is a major concern in these areas, we recommend that Douglas-fir and lodgepole pine be encouraged since they are unaffected by this disease.

Root Rots

Root rots continue to be a vexing problem as they cause various amounts of mortality throughout the state. During the past year State and U.S. Forest Service personnel examined Douglas-fir in mortality centers in the Boise National Forest and found *Polyporus schweinitzii* Fr. root decay commonly associated with Douglas-fir bark beetles. The presence of insects and diseases interacting as a complex in causing tree mortality makes recognition and treatment difficult since all factors must be considered in sound management prescriptions.

In northern Idaho, the Forest Service has initiated a root rot study in the Panhandle National Forest to examine the effects of different harvesting methods on regeneration in clearcut root rot centers. As foresters become more familiar with the symptoms of root rot problems more centers will continue to be discovered, increasing the demand for additional research.

DWARF MISTLETOES

DWARF MISTLETOE, *Arceuthobium* spp.

Dwarf mistletoe is the number one disease problem in many areas of southern Idaho. Ponderosa pine, Douglas-fir and lodgepole pine may all be infected to varying degrees in these areas. Heavy concentrations of Douglas-fir dwarf mistletoe were observed in the Rice Creek drainage of the Joseph Plains area southwest of Craigmont this year. Although control guidelines are available[1/], dry site conditions, steep slopes and economic situations may hinder their proper application.

Many forests in northern Idaho contain abundant larch reproduction growing up under an overstory of old, decadent, highly infected larch. If larch is to be a viable crop tree, overstory removals must be incorporated into management plans along with sanitation efforts to cleanse young stands before they become hopelessly infected.

DECAYS

We continue to be plagued by severe decay losses, especially in older growth and previously logged stands where very little concern was given for the residual trees. Decays of cedar by *Phellinus (Poria) weirii* (Murr.) Gilb. and *Polyporus sericeomollis* Rom. *(Poria assiatica)*, hemlock and true firs by *Echinodontium tinctorium* Ell. and Ev. are the principal causes. Several other decay fungi may be important factors in localized areas on other conifer species. For example, red ring rot, caused by *Fomes pini* (Brot. ex. Fr.) Karst. is especially common on white pine and larch in the Clearwater, St. Joe and Priest Lake areas. As old growth timber is harvested and more conscientious harvesting practices are utilized to improve the health and selection of residual trees, losses to decays are expected to decline.

1/ Schwandt, J. 1977. Dwarf Mistletoe Control Guidelines for Idaho Forests, Bureau of Private Forestry, Department of Lands, Coeur d'Alene, Idaho. 13p.

Dutch Elm Disease

DUTCH ELM DISEASE, *Ceratocystis ulmi* (Buism.) C. Mor.

Although not a forest problem, losses to Dutch elm disease in southern Idaho communities are causing a great deal of concern. The heaviest losses are in the larger municipalities (Boise, Nampa, Caldwell) in Canyon and Ada Counties where American elms were planted extensively. Dutch elm disease has now spread to ten counties from Payette in the west to Cassia in the east, and is continuing to spread each year. The following table is an alphabetical listing of counties with dutch elm disease showing current and expected losses:

SUMMARY OF AMERICAN ELM TREE LOSSES BY COUNTY

County	Number Initially	Already Lost		Expected Loss/Year	
		%	#	%	#
Ada	10,000	25	2,500	2	115
Canyon	6,000	38	2,300	41	1,475
Cassia	300	10	30	5	10
Elmore	1,000	5	45	5	50
Gem	200	75	150 a/	20	10
Gooding	200	5	10	10	10
Jerome	800	37	300	25	125
Minidoka	200	12	25	5	10
Payette	2,500	50	1,225	25	305
Twin Falls	2,200	23	500	20	200

a/ Losses not all Dutch Elm Disease caused.

The ten-county total shows that over 7,000 elms have already been killed by Dutch elm disease from an initial total of over 23,000. This is a 30% loss overall, but is not representative of the actual situation since some counties have suffered much greater losses than others. The rate of spread within a city or county is closely tied to the density of the American elm tree population. Many cities which have suffered heavy losses in the past are now experiencing only slow losses since the remaining healthy trees are so widely distributed.

Annual losses in these areas are expected to be about 15% unless substantial control efforts are initiated. There are an estimated 5,000-10,000 American elms in more than ten adjacent counties which may be considered as high risks. Boise and Caldwell are the only two cities with active control programs. In spite of only protecting about one-half of its elm population, Boise has greatly reduced mortality by a spray and sanitation program aimed at protecting the trees from the bark beetle vector of the disease and removing infected trees as soon as possible.

SUMMARIES OF INFESTED ACRES AND/OR TREES BY STATE FOREST PROTECTIVE DISTRICT

FIR ENGRAVER

District	Acres		Trees		Volume (fbm)	
	1976	1977	1976	1977	1976	1977
Priest Lake			9	7		2,100
Pend Oreille		75	62	226	4,960	67,800
Mica	50	650	138	1,124	41,400	337,200
Cataldo	600	7	508	58	152,400	17,400
West St. Joe	850	275	716	761	214,800	228,300
Kendrick	50	5	128	43	38,400	12,900
C.P.T.P.A.	2,100	260	2,010	781	603,000	234,300
Craig Mountain	600	268	656	265	196,800	79,500
Maggie Creek	1,751		450		135,000	
TOTALS	6,001	1,540	4,677	3,265	1,386,760	979,500

WESTERN PINE BEETLE

District	Acres		Trees		Volume (fbm)	
	1976	1977	1976	1977	1976	1977
Priest Lake						
Pend Oreille	5		8		3,200	
Mica			6		2,400	
Cataldo			7		2,800	
West St. Joe			12		4,800	
Kendrick			2		800	
C.P.T.P.A.			17		6,800	
Craig Mountain	20		38	1	15,200	
Maggie Creek						
TOTALS	25		90	1	36,000	

SUMMARIES OF INFESTED ACRES AND/OR TREES BY STATE FOREST PROTECTIVE DISTRICT

DOUGLAS-FIR BEETLE

District	Acres		Trees		Volume (fbm)	
	1976	1977	1976	1977	1976	1977
Priest Lake	20	2	66	16	26,400	6,400
Pend Oreille	25	5	35	23	14,000	9,200
Mica			3		1,200	
Cataldo	1		27		10,800	
West St. Joe		10	100	91	40,000	36,400
Kendrick		5	35	56	14,000	22,400
C.P.T.P.A.	300	157	1,880	940	676,800	282,000
Craig Mountain	50		38		15,200	
Maggie Creek						
TOTALS	396	179	2,184	1,126	924,400	356,400

IPS

District	Acres		Trees		Volume (fbm)	
	1976	1977	1976	1977	1976	1977
Priest Lake				4		
Pend Oreille			25	23		
Mica	10	175	65	608		
Cataldo		10		83		
West St. Joe		910	10	1,113		
Kendrick		7		74		
C.P.T.P.A.		100	18	611		
Craig Mountain	45	225	87	941		
Maggie Creek						
TOTALS	55	1,427	205	3,457		

SUMMARIES OF INFESTED ACRES AND/OR TREES
BY STATE FOREST PROTECTIVE DISTRICT

MOUNTAIN PINE BEETLE

District	WESTERN WHITE PINE				LODGEPOLE PINE			
	Acres		Trees		Acres		Trees	
	1976	1977	1976	1977	1976	1977	1976	1977
Priest Lake			10					
Pend Oreille								
Mica								
Cataldo								
West St. Joe								
Kendrick								
C.P.T.P.A.				9				25
Craig Mountain					10	2,647	20	2,650
Maggie Creek								
TOTALS			10	9	10	2,647	20	2,675

District	PONDEROSA PINE BEETLE					
	Acres		Trees		Volume (fbm)	
	1976	1977	1976	1977	1976	1977
Priest Lake						
Pend Oreille			4		200	
Mica						
Cataldo						
West St. Joe						
C.P.T.P.A.				1		
Craig Mountain	1		5		2,000	
Maggie Creek						
TOTALS	1		9	1	2,200	

SUMMARIES OF INFESTED ACRES AND/OR TREES BY STATE FOREST PROTECTIVE DISTRICT

District	LARCH CASEBEARER Acres		SPRUCE BUDWORM Acres		ROOT ROT Acres		ROOT ROT Trees	
	1976	1977	1976	1977	1976	1977	1976	1977
Priest Lake	75	425						
Pend Oreille	2,100	3,030						
Mica	1,300	2,275	Not Reported		75	125	50	
Cataldo	30				380	155		
West St. Joe	500	1,000			150			
Kendrick	50	4,412					25	
C.P.T.P.A.	1,185	2,195		1,515	40			
Craig Mountain				950				
Maggie Creek								
TOTALS	5,240	13,337		2,465	645	280	75	

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DOUGLAS-FIR BEETLE
MOUNTAIN PINE BEETLE
WHITE PINE BLISTER RUST
PINE ENGRAVER BEETLE

1977

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